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2016

### Test 2156A: Case IH Farmall 110A

Nebraska Tractor Test Laboratory

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# NEBRASKA OECD TRACTOR TEST 2156A—SUMMARY 1037A

## CASE IH FARMALL 110A DIESEL

### 8 SPEED

Chassis serial numbers CT00001M and higher

#### POWER TAKE-OFF PERFORMANCE

| Power<br>HP<br>(kW)                     | Crank<br>shaft<br>speed<br>rpm | Diesel<br>Consumption<br>Gal/hr<br>(l/h) | lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | D.E.F.<br>Consumption<br>Gal/hr<br>(l/h) | Mean Atmospheric<br>Conditions |
|---|--------------------------------|--|-----------------------|-----------------------|--|--------------------------------|
| MAXIMUM POWER AND FUEL CONSUMPTION      |                                |  |                       |                       |  |                                |
| Rated Engine Speed—(PTO speed—630 rpm)  |                                |  |                       |                       |  |                                |
| 92.57<br>(69.03)                        | 2201                           | 5.90<br>(22.32)                          | 0.446<br>(0.272)      | 15.70<br>(3.09)       | 0.40<br>(1.50)                           |                                |
| Standard Power Take-off Speed (539 rpm) |                                |  |                       |                       |  |                                |
| 94.56<br>(70.51)                        | 1890                           | 5.42<br>(20.50)                          | 0.402<br>(0.244)      | 17.46<br>(3.44)       | 0.37<br>(1.38)                           |                                |
| Maximum Power (1 hour)                  |                                |  |                       |                       |  |                                |
| 94.93<br>(70.79)                        | 1750                           | 5.22<br>(19.76)                          | 0.385<br>(0.234)      | 18.18<br>(3.58)       | 0.32<br>(1.21)                           |                                |

#### VARYING POWER AND FUEL CONSUMPTION

|                  |      |                 |                  |                 |                |                       |
|------------------|------|-----------------|------------------|-----------------|----------------|-----------------------|
| 92.57<br>(69.03) | 2201 | 5.90<br>(22.32) | 0.446<br>(0.272) | 15.70<br>(3.09) | 0.40<br>(1.50) | Air temperature       |
| 79.84<br>(59.53) | 2238 | 5.36<br>(20.30) | 0.471<br>(0.286) | 14.89<br>(2.93) | 0.34<br>(1.30) | 75°F (24°C)           |
| 60.86<br>(45.38) | 2267 | 4.57<br>(17.28) | 0.526<br>(0.320) | 13.33<br>(2.63) | 0.27<br>(1.01) | Relative humidity     |
| 41.15<br>(30.68) | 2299 | 3.75<br>(14.18) | 0.638<br>(0.388) | 10.99<br>(2.16) | 0.21<br>(0.81) | 78%                   |
| 20.84<br>(15.54) | 2320 | 3.05<br>(11.55) | 1.026<br>(0.624) | 6.38<br>(1.35)  | 0.12<br>(0.45) | Barometer             |
| 1.69<br>(1.26)   | 2344 | 2.25<br>(8.53)  | 9.334<br>(5.678) | 0.75<br>(0.15)  | 0.08<br>(0.30) | 28.94" Hg (98.00 kPa) |

Maximum torque - 348 lb.-ft. (472 Nm) at 1249 rpm

Maximum torque rise - 57.7%

Torque rise at 1760 engine rpm - 29%

Power increase at 1750 engine rpm - 2.5%

#### DRAWBAR PERFORMANCE

##### UNBALLASTED - FRONT DRIVE ENGAGED

##### FUEL CONSUMPTION CHARACTERISTICS

| Power<br>Hp<br>(kW)                               | Drawbar<br>pull<br>lbs<br>(kN) | Speed<br>mph<br>(km/h) | Crank-<br>shaft<br>speed<br>rpm | Slip<br>% | Fuel Consumption<br>lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | D.E.F.<br>Consumption<br>lb/hp.hr<br>(kg/kW.h) | Temp. °F (°C)<br>cool-<br>ing<br>med | Air<br>dry<br>bulb | Barom.<br>inch<br>Hg<br>(kPa) |
|---|--------------------------------|------------------------|---------------------------------|-----------|---|-----------------------|--|--------------------------------------|--------------------|-------------------------------|
| Power at Rated Engine Speed—5th (H1) Gear         |                                |                        |                                 |           |   |                       |  |                                      |                    |                               |
| 80.30<br>(59.88)                                  | 5166<br>(22.98)                | 5.83<br>(9.38)         | 2200                            | 5.6       | 0.513<br>(0.312)                          | 13.68<br>(2.69)       | NA<br>(NA)                                     | 183<br>(84)                          | 75<br>(24)         | 28.90<br>(97.87)              |
| 75% of Pull at Rated Engine Speed—5th (H1) Gear   |                                |                        |                                 |           |   |                       |  |                                      |                    |                               |
| 62.74<br>(46.78)                                  | 3873<br>(17.23)                | 6.08<br>(9.78)         | 2249                            | 3.8       | 0.567<br>(0.345)                          | 12.36<br>(2.43)       | 0.042<br>(0.026)                               | 183<br>(84)                          | 78<br>(26)         | 28.92<br>(97.93)              |
| 50% of Pull at Rated Engine Speed—5th (H1) Gear   |                                |                        |                                 |           |   |                       |  |                                      |                    |                               |
| 43.24<br>(32.24)                                  | 2587<br>(11.51)                | 6.27<br>(10.09)        | 2284                            | 2.2       | 0.680<br>(0.414)                          | 10.31<br>(2.03)       | 0.055<br>(0.034)                               | 183<br>(84)                          | 79<br>(26)         | 28.91<br>(97.90)              |
| 75% of Pull at Reduced Engine Speed—6th (H2) Gear |                                |                        |                                 |           |   |                       |  |                                      |                    |                               |
| 62.81<br>(46.84)                                  | 3879<br>(17.25)                | 6.08<br>(9.78)         | 1458                            | 3.7       | 0.439<br>(0.267)                          | 15.97<br>(3.15)       | 0.044<br>(0.027)                               | 180<br>(82)                          | 80<br>(27)         | 28.93<br>(97.97)              |
| 50% of Pull at Reduced Engine Speed—6th (H2) Gear |                                |                        |                                 |           |   |                       |  |                                      |                    |                               |
| 43.21<br>(32.22)                                  | 2565<br>(11.41)                | 6.32<br>(10.16)        | 1494                            | 2.1       | 0.492<br>(0.299)                          | 14.24<br>(2.81)       | 0.050<br>(0.030)                               | 179<br>(82)                          | 79<br>(26)         | 28.91<br>(97.90)              |

**Location of tests:** Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln Nebraska 68583-0832

**Dates of tests:** August 30 to September 7, 2016

**Manufacturer:** CNH De Mexico, Queretaro Mexico

**CONSUMABLE Fluids, OIL and TIME: Fuel** No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8418 **Fuel weight** 7.009 lbs/gal (0.840 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil** SAE 10W30 **API service classification** CJ-4 **Transmission, hydraulic and front axle lubricant** Case IH Akcelra Nexplore fluid **Total time engine was operated** 16.5 hours

**ENGINE: Make** F.P.T NEF **Diesel Type** Four cylinder vertical with turbocharger, air to air intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** 001388393 **Crankshaft** lengthwise **Rated engine speed** 2200 **Bore and stroke** 4.094" x 5.197" (104.0 mm x 132.0 mm) **Compression ratio** 17.0 to 1 **Displacement** 274 cu in (4485 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Exhaust** DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) integrated within a vertical muffler **Cooling medium temperature control** one thermostat

**ENGINE OPERATING PARAMETERS: Fuel rate:** 38.5 - 41.7 lb/h (17.5 - 18.9 kg/h) **High idle:** 2325 - 2375 rpm **Turbo boost:** nominal 16.7- 19.6 psi (115 - 135 kPa) as measured 18.2 psi (125 kPa)

**CHASSIS: Type** front wheel assist **Serial No.** NT01005M **Tread width** rear 64.0" (1625 mm) to 78.0" (1981 mm) front 64.0" (1625 mm) to 66.0" (1676 mm) **Wheelbase** 99.3" (2521 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph (km/h)** first 1.67 (2.68) second 2.56 (4.12) third 3.48 (5.60) fourth 4.83 (7.77) fifth 6.14 (9.88) sixth 9.45 (15.21) seventh 12.83 (20.65) eighth 17.82 (28.68) reverse 1.72 (2.77), 2.65 (4.26), 3.60 (5.79), 5.00 (8.04), 6.35 (10.22), 9.77 (15.73), 13.27 (21.36), 18.43 (29.66) **Clutch** single dry disc operated by foot pedal **Brakes** single wet disc operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1890 engine rpm or 1000 rpm at 2049 engine rpm **Unladen tractor mass** 10245 lb (4647 kg)

## DRAWBAR PERFORMANCE

### UNBALLASTED - FRONT DRIVE ENGAGED

#### MAXIMUM POWER IN SELECTED GEARS

| Power<br>Hp<br>(kW) | Drawbar<br>pull<br>lbs<br>(kN) | Speed<br>mph<br>(km/h) | Crank-<br>shaft<br>speed<br>rpm | Slip<br>% | Fuel Consumption<br>lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | D.E.F<br>Consumption<br>lb/hp.hr<br>(kg/kW.h) | Temp.°F(°C)<br>cool-<br>ing<br>med | Air<br>dry<br>bulb | Barom.<br>inch<br>Hg<br>(kPa) |
|---------------------|--------------------------------|------------------------|---------------------------------|-----------|---|-----------------------|---|------------------------------------|--------------------|-------------------------------|
| 3rd (L3) Gear       |                                |                        |                                 |           |   |                       |   |                                    |                    |                               |
| 68.02<br>(50.72)    | 8485<br>(37.74)                | 3.01<br>(4.84)         | 2216                            | 14.8      | 0.592<br>(0.360)                          | 11.85<br>(2.33)       | 0.052<br>(0.032)                              | 184<br>(84)                        | 80<br>(27)         | 28.90<br>(97.87)              |
| 4th (L4) Gear       |                                |                        |                                 |           |   |                       |   |                                    |                    |                               |
| 77.74<br>(57.97)    | 6547<br>(29.12)                | 4.45<br>(7.16)         | 2200                            | 8.7       | 0.529<br>(0.322)                          | 13.24<br>(2.61)       | NA<br>(NA)                                    | 183<br>(84)                        | 73<br>(23)         | 28.90<br>(97.87)              |
| 5th (H1) Gear       |                                |                        |                                 |           |   |                       |   |                                    |                    |                               |
| 80.30<br>(59.88)    | 5166<br>(22.98)                | 5.83<br>(9.38)         | 2200                            | 5.6       | 0.513<br>(0.312)                          | 13.68<br>(2.69)       | NA<br>(NA)                                    | 183<br>(84)                        | 75<br>(24)         | 28.90<br>(97.87)              |
| 6th(H2) Gear        |                                |                        |                                 |           |   |                       |   |                                    |                    |                               |
| 79.47<br>(59.26)    | 3231<br>(14.37)                | 9.23<br>(14.85)        | 2200                            | 3.0       | 0.517<br>(0.315)                          | 13.55<br>(2.67)       | NA<br>(NA)                                    | 183<br>(84)                        | 76<br>(25)         | 28.90<br>(97.87)              |

#### UNBALLASTED - FRONT DRIVE ENGAGED-1750 ENGINE RPM

| Power<br>Hp<br>(kW) | Drawbar<br>pull<br>lbs<br>(kN) | Speed<br>mph<br>(km/h) | Crank-<br>shaft<br>speed<br>rpm | Slip<br>% | Fuel Consumption<br>lb/hp.hr<br>(kg/kW.h) | Hp.hr/gal<br>(kW.h/l) | D.E.F<br>Consumption<br>lb/hp.hr<br>(kg/kW.h) | Temp.°F(°C)<br>cool-<br>ing<br>med | Air<br>dry<br>bulb | Barom.<br>inch<br>Hg<br>(kPa) |
|---------------------|--------------------------------|------------------------|---------------------------------|-----------|---|-----------------------|---|------------------------------------|--------------------|-------------------------------|
| 3rd (L3) Gear       |                                |                        |                                 |           |   |                       |   |                                    |                    |                               |
| 68.08<br>(50.76)    | 8478<br>(37.71)                | 3.02<br>(4.85)         | 2215                            | 14.6      | 0.592<br>(0.360)                          | 11.85<br>(2.33)       | 0.043<br>(0.026)                              | 184<br>(84)                        | 81<br>(27)         | 28.91<br>(97.90)              |
| 4th (L4) Gear       |                                |                        |                                 |           |   |                       |   |                                    |                    |                               |
| 78.44<br>(58.49)    | 7005<br>(31.16)                | 4.20<br>(6.76)         | 2100                            | 9.5       | 0.518<br>(0.315)                          | 13.54<br>(2.67)       | 0.047<br>(0.029)                              | 183<br>(84)                        | 73<br>(23)         | 28.90<br>(97.87)              |
| 5th (H1) Gear       |                                |                        |                                 |           |   |                       |   |                                    |                    |                               |
| 81.16<br>(60.52)    | 6164<br>(27.42)                | 4.94<br>(7.95)         | 1900                            | 7.4       | 0.471<br>(0.287)                          | 14.88<br>(2.93)       | 0.039<br>(0.024)                              | 182<br>(83)                        | 76<br>(24)         | 28.91<br>(97.90)              |
| 6th(H2) Gear        |                                |                        |                                 |           |   |                       |   |                                    |                    |                               |
| 81.53<br>(60.80)    | 4222<br>(18.78)                | 7.24<br>(11.65)        | 1750                            | 4.5       | 0.447<br>(0.272)                          | 15.67<br>(3.09)       | 0.043<br>(0.026)                              | 181<br>(83)                        | 72<br>(25)         | 28.92<br>(97.93)              |

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**NOTE 1:** The performance results on this report were obtained from tests carried out on the New Holland TS6.110 Diesel.

**NOTE 2:** The performance figures on this report apply to Case IH Farmall 110A tractors with chassis serial numbers CT00001M and higher.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor did not meet the manufacturer's implement flow claim of 22 GPM (83 l/min) with dual pump system. The manufacturer's 3 point lift claim of 7326 lb (3323 kg) (with 2 external lift cylinders) was not met when tested per OECD Code 2 standards. The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2156A**, Nebraska Summary 1037A, March 3, 2017.

Roger M. Hoy  
Director

M.F. Kocher  
P.J. Jasa  
J.D. Luck  
Board of Tractor Test Engineers

| TRACTOR SOUND LEVEL WITH CAB | Front Wheel Drive |                     |
|------------------------------|-------------------|---------------------|
|                              | Engaged<br>dB(A)  | Disengaged<br>dB(A) |
| At no load in 4th (4L) gear  | 79.9              | 79.9                |
| Bystander in 8th (4H) gear   |                   | 86.7                |

#### TIRES AND WEIGHT

**Rear Tires** - No., size, ply & psi(kPa)  
**Front Tires** - No., size, ply & psi(kPa)  
**Height of Drawbar**  
**Static Weight with operator** - Rear  
- Front  
- Total

#### Tested Without Ballast

Two 18.4-34;8;16(110)  
Two 14.9-24;6;16(110)  
21.0 in (535 mm)  
6120 lb (2776 kg)  
4300 lb (1950 kg)  
10420 lb (4726 kg)

The 3 point lift performance figures listed below are from tests conducted on the New Holland TS6030 Diesel

## HYDRAULIC PERFORMANCE

CATEGORY: II

Quick Attach: None

OECD Static test

Maximum force exerted through whole range: 6174 lbs (27.46 kN)(2 external lift cylinders)

### Two pump system

#### two outlet sets combined

- i) Sustained pressure of the open relief valve: 2772 psi (191 bar)
- ii) Pump delivery rate at minimum pressure and rated engine speed: 19.1 GPM (72.1 l/min)
- iii) Pump delivery rate at maximum hydraulic power: 14.6 GPM (55.4 l/min)
- Delivery pressure: 2190 psi (151 bar)
- Power: 18.7 HP (13.9 kW)

### single outlet set

- i) Sustained pressure of the open relief valve: 2760 psi (190 bar)
- ii) Pump delivery rate at minimum pressure and rated engine speed: 18.1 GPM (68.4 l/min)
- iii) Pump delivery rate at maximum hydraulic power: 13.9 GPM (52.7 l/min)
- Delivery pressure: 2070 psi (143 bar)
- Power: 16.8 HP (12.5 kW)

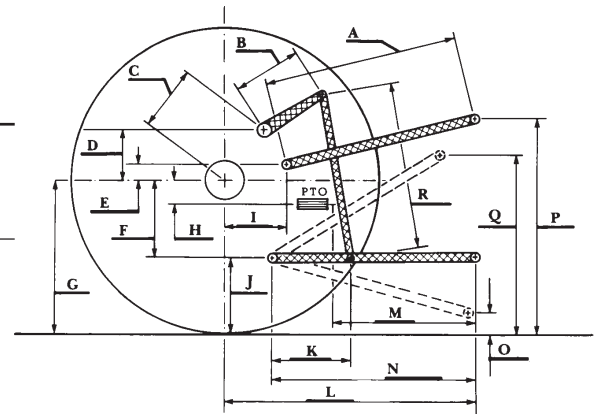
## THREE POINT HITCH PERFORMANCE(SAE Static test)

Observed maximum pressure psi. (bar) 2480 (171)  
 Location: lift cylinder  
 Hydraulic oil temperature: °F (°C) 145 (63)  
 Location: pump inlet  
 Category: II  
 Quick attach: none

### Two external lift cylinders

System pressure 2210 psi (152 Bar)

| Hitch point distance to ground level in. (mm) | 8.0 (203) | 15.0 (381) | 22.0 (559) | 29.0 (737) | 36.0 (914) |
|---|-----------|------------|------------|------------|------------|
| Lift force on frame lb                        | 9270      | 8622       | 8199       | 8361       | 7326       |
| " " " " " (kN)                                | (41.2)    | (38.4)     | (36.5)     | (37.2)     | (32.6)     |



## HITCH DIMENSIONS AS TESTED—NO LOAD

|   | SAE Test |      | OECD Test |      |
|---|----------|------|-----------|------|
|   | inch     | mm   | inch      | mm   |
| A | 27.7     | 705  | 28.5      | 724  |
| B | 9.8      | 250  | 9.8       | 250  |
| C | 14.1     | 357  | 14.1      | 357  |
| D | 13.5     | 342  | 13.5      | 342  |
| E | 8.1      | 205  | 8.1       | 205  |
| F | 9.0      | 229  | 9.0       | 229  |
| G | 30.3     | 770  | 30.3      | 770  |
| H | 0.4      | 10   | 0.4       | 10   |
| I | 12.7     | 323  | 12.7      | 323  |
| J | 21.3     | 541  | 21.3      | 541  |
| K | 18.1     | 460  | 18.1      | 460  |
| L | 40.8     | 1037 | 40.8      | 1037 |
| M | 22.9     | 581  | 22.9      | 581  |
| N | 36.6     | 930  | 36.6      | 930  |
| O | 8.0      | 203  | 8.0       | 203  |
| P | 40.3     | 1024 | 45.3      | 1151 |
| Q | 34.0     | 864  | 34.0      | 864  |
| R | 32.5     | 826  | 32.5      | 826  |



CASE IH FARMALL 110A DIESEL

Institute of Agriculture and Natural Resources  
 University of Nebraska-Lincoln